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EXAMINER	
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ART UNIT	PAPER NUMBER
2871	

DATE MAILED: 08/08/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/020,543	MI ET AL.	
	Examiner	Art Unit	
	Mike Qi	2871	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☐ Responsive to communication(s) filed on _____ .

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) 1-24 is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) 1-24 is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

11)☐ The proposed drawing correction filed on _____ is: a)☐ approved b)☐ disapproved by the Examiner.

If approved, corrected drawings are required in reply to this Office action.

12)☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

13)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☒ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____ .

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

14)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).

a) ☐ The translation of the foreign language provisional application has been received.

15)☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449) Paper No(s) 4 .
4) ☐ Interview Summary (PTO-413) Paper No(s). _____ .
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: .

DETAILED ACTION

Claim Objections

1. Claims 1 and 11 is objected to because of the following informalities:

In claims 1 and 4, recitation ". . . a positive birefinbent material . . ." should be - -. . . a positive birefringent material . . .- - ;

In claim 11, recitation ". . . a compensation disposed . . ." should be - - a compensation film disposed . . .- -.

Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 1 and 9 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

Claim 1, recitation ". . . a compensation film containing a positive birefringent material oriented with its optic axis tilted in a plane perpendicular to the liquid crystal cell face." Is not clear. Because the optic axis tilted in a plane perpendicular to the liquid crystal cell face cannot be clearly found in the drawings. The optic axis tilt in a plane perpendicular to the liquid crystal cell face has an indefinite relation that cannot tell which face of the liquid crystal cell being perpendicular to the optic axis. For examination purpose, if the Fig.10A shows the optic axis being perpendicular to the

liquid crystal cell face, then the Fig.4A also shows the optic axis being perpendicular to the liquid crystal cell face.

Claim 9, recitation "an alignment layer between the first positive birefringent layer and the base film" that the alignment layer cannot be found in the drawings and cannot be found the corresponding description in the specification to describe such limitation.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

5. Claims 1-3, 10 and 14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant admitted prior art (AAPA) in view of US 6,034,756 (Yuan et al).

Claim 1, AAPA discloses (page 1, line 11 – page 4, line 10; Fig.4A) a vertical–aligned liquid crystal display (an imaging component) comprising:

- a vertically aligned nematic liquid crystal cell (14);
- a polarizer (18 or 12);
- a compensation film (27) containing a positive birefringent material oriented with its optic axis.

AAPA does not expressly disclose the compensation film containing a positive

birefringent material oriented with its optic axis in a plane perpendicular to the liquid crystal cell face.

However, if the Fig.10A of the embodiment of this application shows the optic axis being perpendicular to the liquid crystal cell face, then the Fig.4A of the AAPA also shows the optic axis being perpendicular to the liquid crystal cell face. Besides Yuan discloses (col. 3, lines 26 – 45; Fig.5) that the compensating layer (180) having optic axis in the substrate (182) and it is normal to plane of the LC cell substrate (perpendicular to the liquid crystal cell), and such compensating layer with this tilt can improve the performance of the viewing angle of a TN LCD.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use a compensation film as claimed in claim 1 for improving the viewing angle of the display.

Claim 2, AAPA discloses (Fig.4A) that a pair of polarizers (18, 12) disposed on opposite side of the vertical aligned liquid crystal cell (14), the polarizers (18,12) having polarization axes orthogonally crossed with respect to each other in a direction normal to the cell surface.

Claims 3 and 10, AAPA discloses (Fig.4A) that the compensation film (27 or 30) is disposed between the liquid crystal cell (14) and the polarizer (18 or 12);

Claim 14, Yuan discloses (col.3, lines 26 – 45; Fig.5) that the compensating layer (180) includes substrate (182) (base film), alignment layer (184) and discotic compound layer (186), and the optic axis of the discotic compound layer (186) is changed, and this change in optic axis is designed to mimic to some degree the tilt of the direction in the

LC cell, such that the compensating layer with this tilt can improve the performance of the viewing angle of a TN LCD.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film varies as claimed in claim 14 for improving the performance of the viewing angle of the display.

6. Claim 4 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Yuan as applied to claims 1-3, 10 and 14 above, and further in view of US 5,747,121 (Okazaki et al).

Claim 4, Okazaki discloses (col.2, lines 12 – 41) that it is known that the optical compensatory sheet is needed to have negative birefringence for compensating positive birefringence of the twisted nematic liquid crystal and an inclined optic axis. Such that the compensation film is needed to have a positive birefringence for compensating the negative optical anisotropy with an axis along the normal of the substrate, and that would have been at least obvious variation. Okazaki also discloses (col.2, lines 27 – 41) that it also is known the optical compensatory sheet for LCD is prepared on a support film (base film) to support the compensation film.

Since the compensation film must have a base film to support the compensation film and the positive birefringent material must compensate the negative optical anisotropy material, so that to enlarge the viewing angle of the display.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a compensation film as claimed in claim 4 for enlarging the viewing angle of the display.

7. Claims 5-6, 8-9 and 11-12 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Yuan as applied to claims 1-3, 10 and 14 above, and further in view of US 6,115,095 (Suzuki et al).

Claims 5-6, Suzuki discloses (col.12, line 21 – col.13, line 20; Fig.11) that using first compensation layer having positive optical anisotropy and second compensation layer having positive optical anisotropy, and the two compensation layer can be positioned adjacent to each other (such as a second compensation layer disposed on the first compensation layer), and the compensation layer must have a base film to support the compensation layer. Suzuki also discloses (col.8, lines 27-58) that a product (ΔnF2xdF2) of index anisotropy ΔnF2 and a thickness dF2 of the second compensation layer is equal to a quarter of the product (Δnxd) of index anisotropy Δn and a thickness d of the liquid crystal layer, and a product (ΔnF1xdF1) of index anisotropy ΔnF1 and a thickness dF1 of the first compensation layer is equal to about a half of the product (Δnxd) of index anisotropy Δn and a thickness d of the liquid crystal layer. The same material for the compensation layer must have the same index anisotropy, such that the thickness dF2 of the second compensation layer must be different (such as thinner) from the thickness dF1 of the first compensation layer. So that Suzuki discloses using two compensation layers having different thickness. Suzuki indicates (col.7, lines 57-59) that such compensation layers compensate the fluctuation in birefringence of the liquid

crystal layer caused by variation of a viewing angle. Suzuki also indicates (col.8, lines 20-26) that using two compensation layers to prevent occurrence of light-loosing in oblique viewing angle. Suzuki also indicates (col.9, lines 35-52) that an increase or decrease of birefringence in a liquid crystal layer is compensated for by birefringence variation in a compensation layer when a viewing angle varies, and ensures enhanced optical compensation effect.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use two compensation film having positive birefringent material and having different thickness as claimed in claims 5-6 for preventing the light-loosing in oblique viewing angle and compensate the birefringence variation and enhancing the optical compensation effect.

Claim 8, Yuan discloses (col.3, lines 26 – 45; Fig.5) that the compensating layer (180) includes substrate (182) (base film), alignment layer (184) and discotic compound layer (186), and the optic axis of the discotic compound layer (186) is changed, and this change in optic axis is designed to mimic to some degree the tilt of the direction in the LC cell, such that the compensating layer with this tilt can improve the performance of the viewing angle of a TN LCD.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film varies as claimed in claim 8 for improving the performance of the viewing angle of the display.

Claim 9, the function of the alignment layer is to control the pretilt of the liquid crystal molecules, and it was common and known in the art using an alignment between

the base film and one of the compensation layer, such as the structure of the AAPA disclosed in Fig.4A, in which an alignment layer can be used to control the pretilt of the liquid crystal molecules.

Claim 11, AAPA discloses (Fig.4A) that a compensation film (27) disposed on each side of the liquid crystal cell (14) between the cell (14) and each of the polarizers (18 or 12).

Claim 12, AAPA discloses (Fig.4A) that two compensation films (27 and 30) disposed between the vertical aligned liquid crystal cell (14) and one of the polarizers (18 or 12).

8. Claims 7 and 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Yuan as applied to claims 1-3, 10 and 14 above, and further in view of US 5,796,456 (Takatori et al).

Claims 7 and 13, Takatori discloses (col.6, lines 15-62) that the optical compensation layer uniformly tilt against the axis normal to the surface of the optical compensation layer, and so that the direction of each of their respective optical axes almost correspond to the direction of the liquid crystal when a voltage is applied to the liquid crystal, and such the optical compensation layer improves the view angle dependency.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film is uniform as claimed in claims 7 and 13 for improving the view angle dependency.

9. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA and Yuan as applied to claims 1-3, 10 and 14 above, and further in view of US 6,319,963 (Coates et al).

Claim 15, AAPA discloses (Fig.4A) that the compensation film (27 or 30) is disposed between the vertical aligned cell (14) and the polarizer (18 or 12).

AAPA does not expressly disclose the vertical aligned liquid crystal cell is disposed between the polarizer and a reflective plate.

However, Coates discloses (col.3, line 60 – col.4, line 28) that a reflective film prepared on a substrate is suitable for mass production, and using reflective polarizer (such as a reflective plate) in a liquid crystal display exhibits a high luminance and a considerable brightness up to large viewing angles.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange a reflective plate as claimed in claim 15 for achieving high luminance and a considerable brightness up to large viewing angles.

10. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Yuan and Coates as applied to claims 1-3, 10, 14 and 15 above, and further in view of US 5,747,121 (Okazaki et al) and US 5,796,456 (Takatori et al).

Okazaki discloses (col.2, lines 27 – 41) that it is known the optical compensatory sheet for LCD is prepared on a support film (base film) to support the compensation film. Takatori discloses (col.6, lines 15-62) that the optical compensation layer uniformly tilt against the axis normal to the surface of the optical compensation layer, and so that the direction of each of their respective optical axes almost correspond to the direction

of the liquid crystal when a voltage is applied to the liquid crystal, and such the optical compensation layer improves the view angle dependency.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film is uniform as claimed in claim 16 for improving the view angle dependency.

11. Claims 17 and 20-24 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Yuan and Coates as applied to claims 1-3, 10, 14 and 15 above, and further in view of US 5,747,121 (Okazaki et al).

Okazaki discloses (col.2, lines 27 – 41) that it is known the optical compensatory sheet for LCD is prepared on a support film (base film) to support the compensation film. Yuan discloses (col.3, lines 26 – 45; Fig.5) that the compensating layer (180) includes substrate (182) (base film), alignment layer (184) and discotic compound layer (186), and the optic axis of the discotic compound layer (186) is changed, and this change in optic axis is designed to mimic to some degree the tilt of the direction in the LC cell, such that the compensating layer with this tilt can improve the performance of the viewing angle of a TN LCD.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film varies as claimed in claim 17 for improving the performance of the viewing angle of the display.

Claim 20, concerning the limitation of an electronic imaging device containing the component of claim 1 that is only given weight as intended use, because any display can be used for the electronic imaging device.

Claims 21-24, Okazaki discloses (col.2, lines 27 – 56) that according to the prior art of record the birefringence plate with orienting compound by the application of the magnetic or electric field or use rubbing, and that is conventional to force the molecules aligned in the electric filed direction or the rubbing direction. Using shear to force the orientation also is common and known in the art and using photo-alignment such as using UV-irradiation also is common and known in the art because the shear force would have stronger alignment and the UV-irradiation would reduce the surface friction and protecting the display panel. Therefore, it would have been obvious to those skilled in the art at the time the invention was made to use photo-alignment or rubbing or shear force or electric field as claimed in claims 21-24 for achieving the efficient alignment of the compensating film.

12. Claims 18 and 19 are rejected under 35 U.S.C. 103(a) as being unpatentable over AAPA, Yuan and Coates as applied to claims 1-3, 10, 14 and 15 above, and further in view of US 6,115,095 (Suzuki et al) and US 5,796,456 (Takatori et al).

Claims 18 and 19, Suzuki discloses (col.12, line 21 – col.13, line 20; Fig.11) that using first compensation layer having positive optical anisotropy and second compensation layer having positive optical anisotropy, and the two compensation layer can be positioned adjacent to each other (such as a second compensation layer disposed on the first compensation layer), and the compensation layer must have a

base film to support the compensation layer. Suzuki also indicates (col.8, lines 20-26) that using two compensation layers to prevent occurrence of light-loosing in oblique viewing angle.

Takatori discloses (col.6, lines 15-62) that the optical compensation layer uniformly tilt against the axis normal to the surface of the optical compensation layer, and so that the direction of each of their respective optical axes almost correspond to the direction of the liquid crystal when a voltage is applied to the liquid crystal, and such the optical compensation layer improves the view angle dependency.

Yuan discloses (col.3, lines 26 – 45; Fig.5) that the compensating layer (180) includes substrate (182) (base film), alignment layer (184) and discotic compound layer (186), and the optic axis of the discotic compound layer (186) is changed, and this change in optic axis is designed to mimic to some degree the tilt of the direction in the LC cell, such that the compensating layer with this tilt can improve the performance of the viewing angle of a TN LCD.

Therefore, it would have been obvious to those skilled in the art at the time the invention was made to arrange the tilt in the optic axis of the compensation film is uniform as claimed in claim 18 or to arrange the tilt in the optic axis of the compensation film varies as claimed in claim 19 for improving the performance of the viewing angle of the display.

13. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Mike Qi whose telephone number is (703) 308-6213.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.

Mike Qi
July 11, 2003